This booklet is intended for the parents and caregivers of students participating in the Tauranga Intermediate School Science Fair.

Participation in the School science Fair is compulsory for ALL students in the school as it is seen as an important part of the Science program for this age group. This can be done individually or in pairs (usually within class combinations as they are marked by the classroom teacher). The classroom teacher may group a few of their students together and complete a simple science fair entry with the support of teacher aides and the science Department, within the classroom, and present this at the House display.

It is intended to be a combination of **home and classroom** activity and will be monitored by the classroom teacher. It will initially be marked by the student and classroom teacher and is a *Windows Book* entry. Teachers are given a marking criteria but please NOTE marks tend not to be as percentages. Each entry will be on display in the hall during their House Science Fair day in the **week 11** of **Term 2**.

The best of each house as chosen by The Head of Science will be judged by outside professionals as well as teachers from the school later that week. Three or four houses at a time display their work over a three day period and the HOD science will shortlist (yellow dot) a total of about **120 from the whole school**. Please note your HOD science is a very experienced science fair judge and has seen approximately 10,000 science fair displays at this school and another 1500 at regional level over the years. This number is based upon the number of qualified external judges we can obtain, the time we have to judge them (Thursday morning) and the number we are generally allocated for the Regional Science Fair (18-24). ALL judging in the hall as is the case for the Regional Science Fair is not marked as a percentage but does use the guidelines given to Judges at the BOP regional Science Fair. The HOD Science DOES NOT JUDGE at the final School Science Fair but organises and facilitates the day.

The standard of work and the marking criteria INCREASES as the student progresses from Class to House to School to Regional Science Fair to National Science Fair to World Science Fair.

The piece of work that is to be done must focus on an INVESTIGATION using " Fair Testing". It is NOT a demonstration, research topic nor a repeat of a classroom experiment.

Please note:

If your experiment or investigation involves using people or animals (any living creature) you **MUST** complete an "Animal Ethics Form" which can be collected from the science lab. It must be signed by the student, parent, teacher and HOD Science.

If your experiment involves working with micro-organisms (**bacteria, fungi or viruses**) please see the science specialist Mr Marsh **BEFORE** you start the experiment.

ALL INVESTIGATIONS/EXPERIMENTS must follow the school safety rules therefore no explosive, toxic or corrosive materials, drugs (including cigarettes) or alcohol, high voltage experiments please.

If you have any problems see the classroom teacher in the first instance. The Science Teacher can be seen during the breaks by students to discuss any problems and parents can contact him at school ☎ 578 4401 Ext 141 e-mail johnm@tauranga-int.school.nz. Every year I help students with solving problems measuring data, tables, graphs and analysing data. Students without access to computers at home I am happy set them up with tables and graphs.

Your child will be asked to complete either a Science Investigation or a Technology Investigation/Process. Briefly the Science is an experiment or series of experiments whereas the Technology is inventing something or a process that solves a problem. The invention may be a new approach to an old solution that is better, cheaper or more environmentally friendly. At the Regional Science Fair in recent years, **unique or innovative idea and inventions/solutions** tended to **attract more attention** from judges than was allocated in the judges briefing. A logbook is **crucial** for the Technology Investigation and **is a requirement** for the Science Investigation at the Regional Science Fair.

Choosing a topic is often the hardest part of this and Google *Science Fair* is an easy way to get ideas. I often ask students what they like to do in their spare time and look for a topic there. The Regional Science Fair has awards and $$$ prizes associated with; engineering, conservation (a number), things Maori, radio, mineral/mining, statistics, flour/baking industry, forestry, horticulture, agriculture, sports, technology. In addition we have an engineering award sponsored by IPENZ which in turn compete with local Intermediate Schools for a further IPENZ award. JUDGES are very big on NUMBERS so try and present results so that they can be put in tables and graphs.

Role of the School, Parents, Caregivers and other Adults

We are there to be supportive, give technical advice when asked but it is not our project

My expectation as HOD Science at this school is that your child's teacher is there to encourage, support and monitor this process. Classroom teachers have been given the teaching resources, a good range of excemplars, marking systems, and support (from the science department) they need to ensure your child has every opportunity to succeed in this. Some teachers do ask for moderation of their marking. The school can not afford to give equipment to students to complete their Science Fair although the labs are available to students to conduct experiments when possible and after negotiation with the HOD Science.

Parents your role can be to: ensure what your child does is safe for them and the environment; help focus your child so that ideas can be practically achieved in terms of time, financially and criteria for judging; giving technical support with building apparatus; helping to provide equipment and other materials; obtaining access to technical equipment or materials or costings for technology; help with presenting data; proof-reading for sense and purpose; advice on presentation.

Please note: teachers, HOD Science and our external judges are quick to pick up on displays that are "parent" generated and not "pupil created". If there is any doubt, further investigation of the pupils understanding of the project will occur as has been the situation on a number of occasions over the years.

Where an experiment is likely to run for a long time such as growing plants, weather observations, long term effects of something….. then do start early. The earlier your child starts the more information they can gather, the opportunity to repeat experiments, the more time they have to solve problems and the less stress there is in your house due to deadlines. Judges do like to see data gathered over time, many repeats (I suggest at **least** 5 repeats per experiment, and at **least** 10 subjects per experiment). Of course the more you have the better the validity and reliability of your child's experiment.

Suggested and actual Timeline for students		
1	Choose a topic including is it a *Science or Technology* display	Week 1 Term 2 19th April
2	Completed Aim and Hypothesis (science) or Question (technology)	Week 1 Term 2 19th April - 23rd April
3	Planned how you are going to complete experiments (science) or investigation of needs assessment and prototype design (technology) ☐ *What do you need?* ☐ *Who do you use?How many?* ☐ *What help do you require?* ☐ *How will you measure and collect data?* ☐ *How many trials/experiments/prototypes will you complete?* ☐ *How will you present data? Numbers are good!* ☐ *Do you need to complete a Animal Ethics form?*	Week 1 Term 2 19th April - 23rd April
4	Start experiments (science) or needs assessment (technology)	Week 2 Term 2, 26th April -
5	Needs assessment (technology) completed	Week 2 Term 2 30th April - 2nd May
6	Experiments (science) and prototype testing (technology) completed	Week 2/3 Term 2 30th April - 9th May
7	First draft completed	Week 4 Term 2 10th April - 16th April
8	All written work, diagrams, tables, graphs, photos, and other graphics completed and checked by the class teacher **BEFORE** it is attached to the display	Ending Week 5 Term 2, 21st May Any completed before this date can be checked early by teacher.
9	**Completed display ready to be marked by teacher**	Ending Week 6 Term 2, 28th May
10	Science Fair Week in the hall	Week 11of term 2 28th June- 2nd July
11	Top 120 Science Fair displays in school hall for independent judging	Thursday of Week 11 Term 2. 1st July
12	School Science Fair Team selection	Friday of Week 11 Term 2. 2nd July
13	Regional Science Fair (Rotorua) 2010	TBA (mid August)

When creating a **Science** display think about the following	
Introduction	● What do you already know? ● Why did you choose this topic/…be brief
Aim	● What do you want to find out? Be clear and brief. ● Ask some questions that you will attempt to answer.
Hypothesis	● What do you predict will happen in your experiment? (usually 2 sentences long) ● If I …..then….will happen type sentences.
Equipment	● What do you have to carry out the experiment? ● List what you used including people.
Method	● What did you do? ● Give instructions clearly and in order. ● Be precise and accurate ● Number each instruction.
Recording & Results	● Usually shown as a table of raw data, samples, photos, graphs, a brief description or diagram ● There needs to be a clear but precise **<u>written</u>** description of what happened. ● DESCRIBE don't explain!
Discussion of your results	● An analysis of results ● Talk about what happens in graphs or tables ● Graphs must have:- an even scale, be accurate, title, a key
Conclusion	● Was your hypothesis correct? If so how? If not why? ● Have a summary of the results ● What have your learnt? What is the science? ● How is this used in our lives? Applications? ● How could you have done better? Where does this lead us? ● Be precise ● Each paragraph has one clear idea.

Judges will be looking for the following in a **Science Investigation**;

Communication	● Students ability to discuss findings/ significance of findings ● Ability of students to explain scientific principles involved

Scientific Process & Background	• Clear Aim, Hypothesis carried through • Method:- accurate experimentation and data • Accurate experimentation, controls, variables , repeats • Results:- clear, accurate, appropriate data • Conclusions:-in line with Aim/Hypothesis, results interpreted and discussed
Technical Skills	• Design of the experiments • Use of apparatus and equipment
Originality	• Imaginative/creative ideas • New or unusual application in Science
Presentation of display	• Clarity, colour, graphics, neatness • Innovative appeal

When creating a **Technology** display think about the following	
Needs Assessment	• What do you already know? • Why did you choose this topic/…be brief • Identify the need and research this…is it really needed? What do the users expect? • Investigate existing solutions…and identify their short comings in relation to the identified need. • Examine all information in relation to this need…survey results, graphs, tables and statistics would be useful.
Project Development	• You MUST show the development of a product, process or environment • Include ALL documentation, plans, models, photos, notes, conversations to verify this process. • Have a range of technological aspects been measured or estimated eg • Efficiency; optimisation; reliability; economy of operation; safety; working life; cost effectiveness; use of appropriate materials; ease of use; ergonomics; aesthetics; environmental soundness:- its future development, manufacture or disposal would not cause environmental damage

Marketing	● How would you package this product?...give evidence ● Who would you target as a potential buyer and how would you market to them? ● Who and how would this be commercially produced?...give supporting data ● Cost of production and cost to consumer? Give supporting data

Judges will be looking for the following in a **Technology Display**;

Communication	● Students ability to discuss findings/ significance of findings ● Ability of students to explain scientific principles involved
Technological Process	● Need or opportunity clearly defined/identified ● Research existing solutions ● Reworking/adaptations/testing **successive** prototypes/ models ● Construction, quality finish, working parts, own skill ● Consistent, logical discussion and interpretation of results ● Appropriate technological aspects of final product:- efficiency/reliability/cost effectiveness/ease of use/ suitable materials/safety/environmental soundness are all considered ● Final product meets end-users needs ● Potential marketing & packaging strategies recorded/ shown
Originality	● Users needs meet in original/innovative ways (supportive data required)
Presentation of display	● Clarity, colour, graphics, neatness ● Innovative appeal
Log Book	● Authentic ongoing record with raw and field data included ● Has supporting documentation, bibliography, acknowledgements…

Websites that may be useful

Ideas	http://www.isd77.k12.mn.us/resources/cf/ideas.html http://www.scifair.org/ideas/index.shtml http://www.twingroves.district96.k12.il.us/ScienceInternet/TopicChoices.html http://www.rsnz.govt.nz/education/science_fairs/index.php Basically in Google search type *Science Fair* which will give you a lot of American sites that are very useful too.
How to complete a great Science Fair Project	http://www.ipl.org/div/kidspace/projectguide/ http://www.scifair.org/articles/sm_shtml Basically in Google search type *Science Fair* which will give you a lot of American sites that are very useful too.

Presentation Guidelines

This is a **major** step so take care. Your entry can only be judged on the information you can communicate:- so the way you set out the display board can determine your results. The Science Department will sell display boards for $10.00 (still the cheapest in town) beginning Term 2 and this will be advertised in the school newsletter.

Make sure

- Your display is eye-catching
- You can follow the display information from left to right, top to bottom
- Your display is free standing
- You have no valuable or dangerous items on your display
- Your display shows the steps you took in your **investigation in the correct order**
- There are NO spelling mistakes or errors
- Nobody will be offended by any of the content
- Any graphics or 3D props are relevant and don't clutter, detract or confuse the audience
- The information is clear, neat and easy to read from a distance (usually 2-3 metres)

- All extra material/models/supportive information fits inside your display area.
- Although these are the official dimensions of the BOP Science Fair there has been in the past a little lee-way granted. The space allocated on the bench is **restricted** to about 1 metre wide and ½ metre deep. In terms of the House science fairs there is a premium for space and we can not really accommodate anything much larger than the dimensions given. Again a little juggling does occur on the day but the results for overlarge displays can not be guaranteed.
- Not all displays use a header card as given with the boards supplied by the school. I tend to find them useful as a judge and they do add to the presentation.